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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,557	07/16/2003	Christophe Boyer	PET-2094	5938

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MILLEN, WHITE, ZELANO & BRANIGAN, P.C.  
2200 CLARENDON BLVD.  
SUITE 1400  
ARLINGTON, VA 22201

EXAMINER

BHAT, NINA NMN

ART UNIT PAPER NUMBER

1764

DATE MAILED: 04/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/619,557

Applicant(s)

BOYER ET AL.

Examiner

N. Bhat

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 18-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☒ Claim(s) 18-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Claims 18-20 provides for the use of the device according to claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 18-20 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1- 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Boyer et al. US 2002/0020359.

Boyer et al. '0020359 teach a device mixing device which is located between two successive granular beds which distribute a polyphase mixture which includes a horizontal plate which covers the entire cross section of the reactor and supporting a plurality of vertically disposed conduits (206) dedicated to passing the gas fraction of the fluid mixture originating from the upper granular bed (204). The distribution means are

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located between granular beds as elements (200 or 220). Specifically Boyer et al. teach in Figure 3, that the gas/liquid mixture from the upper bed (203) flows through conduits (204) that travel the lateral wall of the reactor. The gas is then injected from chamber (201) into the liquid flow via orifices (208) distributed in the walls of the conduits (204). The gas/liquid mixture is thus produced in the conduits that correspond to points for injection the mixture into the lower bed.. The mixing and distribution functions are simultaneous. The conduits or mixer channels have constant diameter through their axial length. The diameters of the conduits are calculating using methods known to the skilled artisan and are in the range of 5mm to 50 mm. The diameter of the orifices is less than 30% of the diameter of the conduit. The number of holes per conduit is in the range of 2 to 6. The difference in height between the levels of the holes is at least 30 mm. The depth of the gas injection chamber is in the range of 100 to 300 mm. Boyer et al. teach that conduits (204) extend below the gas injection chamber (201) by a distance, which prevents a portion of the liquid from propagating along the lower outer surface of the chamber and to reduce the space between the mixture injection point and the inlet into the bed, which is the range of 10 to 50 mm. In order to avoid separating of the liquid/gas mixture before its injection into the bed, the top of the bed is in the range of 0-50mm, where zero is excluded.[Note Figures 1-4, Paragraphs [0036] to [0038] and Paragraphs [0042] to [0044]] The reactor can be used for hydrogenation and or hydrodesulfurization reactions. The reactor as taught and described by Boyer et al. PGPUB 2002/0020359 full anticipates applicant's claims as drafted.

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4. Claims 1- 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Boyer et al. US 2002/0021991.

Boyer et al.'0021991 teach a device for producing and distributing a poly phase mixture between two fluids comprising a chamber for the passage of a first fluid, the chamber pieced by perforated tubes or conduits to pass as second fluid which is a different physical state than the first fluid which is not miscible with the first fluid through the chamber the tubes being pierced by at least one orifice for permitting passage of the first fluid and mixing between the fluid tubes. Specifically, the distribution system is located at the reactor head upstream of the first bed as shown in Figures 3-4. Gas is injected into the mixer/distributor system axially at the reactor head through perforated tubes (018) that traverses a liquid chamber (11). The liquid chamber is supplied by injecting the liquid feed laterally into the reactor via line (102). The operating principle consists of premixing the liquid and gas phases in the conduits before injecting the mixture at different points to the inlet of the granular bed (114). Boyer et al. teach that the tubes (108) extend by a distance below the liquid chamber to prevent a portion of the liquid from propagation beneath the lower outer surface of the chamber and to reduce the space between the mixture injection point and the inlet to the bed. Boyer et al. teach that the number and holes perforated in conduits (108) is calculated using techniques known to the ordinary skilled artisan. The diameter of the holes is less than 75% of the diameter of the conduits and normally more than 2 mm. The diameter of the conduit is again calculated and designed based on the liquid flow rate through the reactor. The depth below the lowest orifice (111) is generally more than 50 mm and in

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the range of 50 to 300mm. The reactor as taught and described by Boyer et al. can be used in hydrogenation treatments, hydrodesulfurization reactions and hydrodenitrogenation processes.[Note Paragraph[0032], Paragraphs [0044] to [0047]] It is maintained that the distribution device for producing a polyphase mixture for distribution a liquid phase and a gas phase inside a vertical reactor upstream of a granular bed or between two successive granular as described by Boyer et al.'0021991 full anticipates applicant's invention as claimed.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 9-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyer et al. US 2002/0021991 in combination with Alcock et al.

Boyer et al. '0021991 teach applicant's mixing and distributing a liquid and gas fluids placed in a reaction chamber upstream from a granular bed or between two

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successive granular beds wherein the device comprises a horizontal plate and plurality of vertical pipes included and upper end and lower end the pipes being pieced by lateral orifices permitting the introduction of dense fluid and some of the light fluid inside the pipes.

However, Boyer et al. does not teach applicant's secondary pipes, tangential exits and secondary pipes.

Alcock et al. teach device for mixing and redistribution reactants between the bed of a multibed mixed phase down flow reactor which includes means for injecting gas into the reactor in a number of parallel perforated pipes extending across the width of the reactor and a number of quench boxes also extending across the width of the reactor. Specifically taught by Alcock et al. is providing perforations in the parallel pipes may be rows of holes on the under surfaces of the pipes, the holes direct the hydrogen at angle from 85° to 5° to the vertical. Further includes is a horizontal tray which includes a plurality of vertical pipes which communicates both with the upper and lower part of the reactor and with the gas injection means as claimed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a device for mixing and distributing a polyphase fluid within a reactor which includes the horizontal plate and multiplicity of substantially vertical pipes which includes the secondary pipes, and gas injection means as claimed by applicant from the combined teachings of Boyer et al. and Alcock et al. Alcock et al. teaches a mixing device which further includes means for injection gas into the reactor having a number parallel perforated pipes extending across the width of the reactor, to

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add the gas injection arrangement as described by Alcock et al. to the reactor mixing/distribution device of Boyer et al. for improving mixing and redistribution of fluid phases within the reactor would have been obvious to one having ordinary skill in the art.

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-8 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 25 and 27-33, 36-38 of copending Application No. 10/024,382 now allowed. Although the conflicting claims are not identical, they are not patentably distinct from each other because both inventions claim an apparatus for mixing and distributing a liquid phase and a gas phase, in a vertically disposed vessel having and top and bottom. The vessel is capable of injection first and second fluids in different physical state or two immiscible fluids, the device



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includes a horizontal plate which supports a plurality of substantially vertical conduits comprising upper and lower ends the conduits comprising lateral orifices at different levels disposed along the vertical walls of the conduits for permitting the gas phase and liquid phase to be introduced into the conduits. Both inventions claim the mixing device within a reactor comprising at least one bed of granular solid, the mixing device being upstream of the granular bed. However, the invention of the 10/024,382 is broader in scope than that of the instant invention in that the specifics with respect to conduit size placement of the lateral orifices, the diameter ratio of the conduits to the diameter of the reactor as claimed have not been specifically claimed. However, to dispose the conduits as claimed in the instant invention would have been obvious to one having ordinary skill in the art because there is clear recognition and teaching in the art how to size and conduits for providing adequate polyphase mixing within a granular bed reactor and to optimize the reactor which provide best polyphase mixing would have been obvious to one having ordinary skill in the art. [Note the case law of *In re Aller* 155 USPQ 233]

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Claims 1-8 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. 10/815,827. Although the conflicting claims are not identical, they are not patentably distinct from each other because both inventions claim an apparatus for mixing and distributing a liquid phase and a gas phase, in a vertically disposed vessel

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having and top and bottom. The vessel is capable of injection first and second fluids in different physical state or two immiscible fluids, the device includes a horizontal plate which supports a plurality of substantially vertical conduits comprising upper and lower ends the conduits comprising lateral orifices at different levels disposed along the vertical walls of the conduits for permitting the gas phase and liquid phase to be introduced into the conduits. Both inventions claim the mixing device within a reactor comprising at least one bed of granular solid, the mixing device being upstream of the granular bed. However, the invention of the 10/619,557 is narrower in scope than that of the instant invention in that the specifics with respect to the density of the pipes and specifically the arrangement of the exit orifices of the secondary tubes being angled have not been specifically claimed. However to provide the mixing conduits having a specific density within a reactor as claimed in the '557 invention would have been obvious to one having ordinary skill in the art because there is clear recognition and teaching in the art how to size the conduits, how many conduits or density is required based on flow rate within the reactor for providing adequate polyphase mixing within a granular bed reactor has been taught and to optimize the reactor which provide best polyphase mixing would have been obvious to one having ordinary skill in the art. [Note the case law of *In re Aller* 155 USPQ 233]

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Forster et al. teach a method of producing a homogeneous gas mixture using a mixing assembly within a catalytic reactor. Westerman et al. teach a multi tube reactor for carrying out a process for catalytic reaction. Van Der Meer et al.

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teach a multiplebed down flow reactor which includes a mixing device (5) for mixing fluids comprising a substantially horizontal collection tray (6) which includes a swirl chamber (7). Harter et al. teach a device for distributing a polyphase mixture on a granular solid bed comprising a porous antispash nozzle. Reynolds et al. teach an up flow reactor with which includes a mixing device including a plurality of conduits. Buchanan teaches a hydroprocessing reactor which includes a gas liquid mixing assembly which includes a plurality of conduits. Euen et al. teach a mixed disposed between two fixed beds. The mixer mixes two gas-liquid phases. Grott et al. teach a hydroprocessing reactor which includes a mixing chamber and distribution tray (21) which includes a plurality of conduits and mixing caps distributed over the surface of the distribution tray. Gupta teach fluid distribution across a particulate bed. Silvey teach a liquid distribution device and pan.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



N. Bhat  
Primary Examiner  
Art Unit 1764